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## REMARKS

In the non-final Office Action, the Examiner noted that claims 1-19 and 23-27 are pending in the application and that claims 1-19 and 23-27 stand rejected. By this response, claims 1, 6, 8, 9, 13-16, 18, and 23 are amended, claims 3-5, 11-12, 17, and 19 are canceled, claims 20-22 were previously canceled, and claims 2-5, 7, 10, and 24-27 continue unamended.

It is to be understood that the applicants, by amending the claims, do not acquiesce to the Examiner's characterizations of the art of record or to applicants' subject matter recited in the pending claims. Further, applicants are not acquiescing to the Examiner's statements as to the applicability of the prior art of record to the pending claims by filing the instant responsive amendments.

In view of the following discussion, the applicants submit that none of the claims now pending in the application are obvious under the provisions of 35 U.S.C. §103. Thus, the applicants believe that all of these claims are now in allowable form.

## REJECTIONS

### 35 U.S.C. §103

#### A.    Claims 1-3 and 9-10

The Examiner has rejected claims 1-3 and 9-10 under 35 U.S.C. §103(a) as being unpatentable over the Asamizuya et al. patent (U.S. Patent No. 6,314,576, issued November 6, 2002, hereinafter "Asamizuya") in view of the Liu et al. patent (U.S. Patent No. 5,970,233, issued October 19, 1999, hereinafter "Liu") and the Russo et al. patent (U.S. Patent No. 5,701,383, issued December 23, 1997, hereinafter "Russo"). The applicants respectfully traverse the rejection.

The applicants have cancelled claim 3. Therefore the rejection is now considered moot. The applicants' have amended independent claim 1 and similarly independent claim 9 to further clarify the features the applicants consider as being inventive. For example, claim 1 (and similarly claim 9), as amended, recites:

> "Apparatus for providing demand television comprising:
>     a broadcast encoder for encoding a real-time video frame
> sequence to form a broadcast bitstream;

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a storage encoder for encoding the <u>real-time</u> video frame sequence
to form a plurality of storage bitstreams, wherein said storage encoder
comprises:
<u>a first encoder for producing a play bitstream that contains
information that, when decoded, produces a forward play video frame
sequence;</u>
<u>a frame subsampler;</u>
<u>a buffer, for storing subsampled frames of the real-time video frame
sequence;</u>
<u>a second encoder for producing a fast forward bitstream that
contains information that, when decoded, produces a fast-forward video
frame sequence;</u>
<u>a third encoder for producing a fast-reverse bitstream that contains
information that, when decoded, produces a fast-reverse video frame
sequence; and</u>
<u>a controller that selects subsampled frames from the buffer and
couples selected frames to the second and third encoders;</u>
a transmission system for transmitting the broadcast bitstream to
subscriber equipment;
<u>a storage device for storing the plurality of storage bitstreams,
wherein the storage device stores the plurality of storage bitstreams
contemporaneous to the transmission system transmitting the broadcast
bitstream; and</u>
wherein said fast forward bitstream contains an indicator that
delimits an end of available data such that a transition from said fast
forward bitstream to at least one of said broadcast bitstream and said play
bitstream is appropriate." (emphasis added).

The test under 35 U.S.C. §103 is not whether an improvement or a use set forth
in a patent would have been obvious or non-obvious; rather the test is whether the
claimed invention, <u>considered as a whole</u>, would have been obvious. <u>Jones v. Hardy</u>,
110 U.S.P.Q. 1021, 1024 (Fed. Cir. 1984) (emphasis added). The applicants submit
that none of the references, either singularly or in combination, teach or suggest the
applicants' invention <u>as a whole</u>.

In particular, the Asamizuya reference discloses that a near video-on-demand
(NVOD) compilation unit edits and compresses film stock such as video film or video
stock recorded on video tape, stores them for a long period, and transmits required
video information to the near video-on-demand playout unit in accordance with the
broadcast. The encoder compresses and encodes the video signals and audio signals
for the film stock or the VTR stock input via the switching circuit based on the MPEG-2

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standard. Accordingly, the signal after the encoder is a digital AV signal compressed and encoded by the MPEG-2 standard. The communication controller fetches a corresponding program stored in the archive storage 116 according to a request from the broadcast side and instruction from the NVOD playout unit, that is, the compilation system controller receiving an instruction for supply at the program supply side, and transmits the same via the communication path to the NVOD playout unit (see, Asamizuya, col. 8, lines 51-56, col. 9, lines 3-19, and col. 10, lines 41-48). As the Examiner concedes, nowhere in the Asamizuya reference is there any teaching or suggestion of the broadcast encoder, and transmitting the bitstream contemporaneous to storing the bitstream.

Furthermore, the Liu reference fails to breach a substantial gap as between the Asamizuya reference and the applicants' invention. In particular, the Liu reference discloses that during encoding, host processor 116 reads the captured bitmaps from memory device 112 via high-speed memory interface 110 and generates an encoded video bitstream that represents the captured video data. Depending upon the particular encoding scheme implemented, host processor 116 applies a sequence of compression steps to reduce the amount of data used to represent the information in the video images. Many video compression schemes divide images into blocks of pixels for compression purposes. The resulting encoded video bitstream is then stored to memory device 112 via memory interface 110. Host processor 116 may copy the encoded video bitstream to mass storage device 120 for future playback and/or transmit the encoded video bitstream to transmit 118 for real-time transmission to a remote receiver (not shown in FIG. 1)

Nowhere in the Liu reference is there any teaching or suggestion of "wherein the storage device stores the storage bitstream contemporaneous to the transmission system transmitting the broadcast stream." Rather, the Liu reference teaches that the encoder applies a sequence of compression steps to reduce the amount of data used to represent the information, as conventionally learned in the art, and the resulting encoded video bitstream is stored to the memory device 112 via the memory interface 110. It is noted that for real-time encoding, the captured data is preferably stored to

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memory device 112, while for non real- time encoding, the captured data is preferably stored to the mass storage device 120 (see, Liu, col. 3, lines 15-19).

As noted above, the host processor may copy the encoded video bitstream to the mass storage device for future playback and/or transmit the encoded video bitstream to the transmitter for real time transmission to the remote receiver. It is further noted that the host processor may either copy the encoded video bitstream to the mass storage device 120 and/or transmit the encoded video bitstream to the transmitter, once the encoded video bitstream has been stored in memory 112 via memory interface 110. That is, the optional copying of the encoded video bitstream or transmission of the video bitstream only occurs after the video bitstream was previously stored elsewhere.

Furthermore, the Liu reference is completely silent with respect to whether the subsequent copying of the video bitstream to the mass storage device 120 and transmitting of the video bitstream and subsequent transmitting of the video bitstream to the transmitter 118 occur contemporaneously. In other words, the Liu reference merely discloses that the host processor may (i) copy the encoded video bitstream to the mass storage device, or (ii) transmit the encoded video bitstream to the transmitter 118, or (iii) copy the encoded video bitstream to the mass storage device and transmit the encoded video bitstream to the transmitter. However, in the latter case, nowhere is there any teaching or suggestion that the copying and transmitting of the encoded video bitstream occurs <u>at the same time</u> (i.e., contemporaneously).

The Examiner contends that it is inherent for the copying and transmitting for the encoded video bitstream to occur contemporaneously. The Applicants respectfully disagree. Specifically, the Liu reference does not inherently teach Applicants' invention as recited in claim 1, since the Liu reference does not <u>necessarily</u> teach the feature "the storage device stores the plurality of storage bitstreams at the same time that the transmission system transmits the broadcast bitstream." For a missing element to be inherent, "extrinsic evidence must make clear that the missing descriptive matter is <u>necessarily present</u> in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. The mere fact that a certain thing <u>may</u> result from a given set of circumstances <u>is not</u> sufficient." <u>In re Roberston</u>, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (internal quotations omitted) (emphasis added).

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Since the Liu reference fails to teach or suggest that the copying and transmitting of the encoded video bitstream occurs <u>contemporaneously</u>, the Liu reference fails to teach or suggest the applicants' invention <u>as a whole</u>.

Further, the Russo reference fails to bridge a substantial gap as between the Asamizuya and the Liu reference with respect to the applicants' invention. In particular, the Russo reference discloses "if a time-shifted version of the program is being output for any reason, a FAST FORWARD command may be entered, in which case playback is speeded up until deactivation of the command, at which time normal playback resumes, resulting in the output of the program exhibiting a reduced time shift, including a zero time shift in the event the operator "catches up" with the incoming program as it is being received (see, Russo, col. 3, lines 31-38). However, nowhere in the Russo reference is there any teaching or suggestion of "wherein the storage device stores the storage bitstream <u>contemporaneous to</u> the transmission system transmitting the broadcast bitstream."

Even if the three references could somehow be operably combined, the references would merely disclose the encoding of video frame sequence to form a storage bitstream, which is then stored in a memory device, copying and/or transmitting the stored encoded video bitstream respectively to another storage device or to a transmitter, and switching between trick play and normal playback. However, nowhere in the three references is there any teaching or suggestion that "the storage device stores the plurality of storage bitstreams <u>contemporaneous</u> to the transmission system transmitting the broadcast bitstream."

The references must be taken in their entireties, including those portions which argue against obviousness. <u>Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.</u>, 230 U.S.P.Q. 416, 420 Fed. Cir. 1986). It is impermissible within the framework of the 35 U.S.C. § 103 to pick and choose from a reference only so much of it as will support a conclusion of obviousness to the exclusion of other parts necessary to a full appreciation of what the reference fairly suggests to one skilled in the art. <u>Id.</u> at 419. Moreover, the invention <u>as a whole</u> is not restricted to the specific subject matter

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claimed, but also embraces its properties and the problem it solves. In re Wright, 6

USPQ 2d 1959, 1961 (Fed. Cir. 1988) (emphasis added).

In this instance, the applicants have solved the problem of providing, in a VOD

system, near real-time availability of fast forward and fast reverse functions and real-

time availability of high bit rate video bitstream that, when decoded, produces a play

sequence. The applicants have solved this problem by including a step where the

storage device stores the plurality of storage bitstreams contemporaneous to the

transmission system transmitting the broadcast bitstream. None of the references,

either singularly or in combination, teach or suggest storing the plurality of storage

bitstreams contemporaneous to the transmission system transmitting the broadcast

bitstream. Therefore, the combined references fail to teach or suggest the applicants'

invention as a whole.

For prior art reference to be combined to render obvious a subsequent invention

under 35 U.S.C. § 103, there must be something in the prior art as a whole which

suggests the desirability, and thus the obviousness, of making the combination.

Uniroyal v. Rudkin-Wiley, 5 U.S.P.SQ.2d 1434, 1438 (Fed. Cir. 1988). The teachings of

the references can be combined only if there is some suggestion or incentive in the prior

art to do so. In re Fine, 5 U.S.P.SQ.2d 1596, 1599 (Fed. Cir. 1988). Hindsight is strictly

forbidden. It is impermissible to use the claims as a framework to pick and choose

among individual references to recreate the claimed invention Id. at 1600; W.L. Gore

Associates, Inc., v. Garlock, Inc., 220 U.S.P.Q. 303, 312 (Fed. Cir. 1983). Moreover,

the mere fact that a prior art structure could be modified to produce the claimed

invention would not have made the modification obvious unless the prior art suggested

the desirability of the modification. In re Fritch, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir.

1992); In re Gordon, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984).

The applicants' invention includes various noteworthy features. One feature is,

as discussed above, "storing the plurality of storage bitstreams contemporaneous to the

transmission system transmitting the broadcast bitstream." Another feature is that from

a single real-time information source (e.g., broadcasted video source), an encoded

bitstream is produced for broadcasting to a plurality of set-top terminals, while the same

real-time source is also encoded to produce a bitstream for storage as a normal-play

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function of a VCR, as well as to produce various trick-play bitstreams, which include a fast-forward bistream and a reverse-play bitstream, where the normal-play, fast-forward, and reverse bitstreams are stored on a storage device contemporaneously as the source information is being broadcasted to the set-top terminals. The applicants submit none of there references may be properly combined to teach or suggest the applicants' invention as a whole. Specifically, nowhere in the references is there any incentive to contemporaneously encode broadcasted real-time information, while also forming and encoding from the broadcasted real-time information, VCR-like bitstreams (e.g., fast forward, reverse, and normal play), and then contemporaneously broadcast such encoded real-time information while storing the encoded VCR-like bitstreams in a storage device.

As such, the applicants submit that independent claim 1 (and similarly independent claim 9) is not obvious and fully satisfies the requirements of 35 U.S.C. §103 and is patentable thereunder. Furthermore, claims 2 and 10 respectively depend from independent claims 1 and 9 and recite additional features thereof. As such, and at least for the same reasons as discussed above, the applicants submit that these dependent claims are also not obvious and fully satisfy the requirements under 35 U.S.C. §103 and are patentable thereunder. Therefore, the applicants respectfully request that the rejections be withdrawn.

B.    **Claims 4, 11 and 16-18**

The Examiner has rejected claims 4, 11 and 16-18 under 35 U.S.C. §103(a) as being unpatentable over Asamizuya and Liu, and Russo in view of Lee (U.S. Patent No. 5,771,335, issued June 23, 1998, hereinafter "Lee"). The applicants respectfully traverse the rejection.

The applicants have cancelled claims 4 and 11. Therefore the rejection of these two claims is now considered moot. Claims 16-18 depend from independent claim 9 and recite additional features thereof. For example, dependent claim 16, when combined with the base claim 9, recites in part:

"A method for providing demand television comprising the steps of:
encoding, in real-time, a broadcast video frame sequence to form a
broadcast bitstream, while contemporaneously encoding the broadcast video

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frame sequence to form a plurality of storage bitstreams, wherein said plurality of storage bitstreams are contemporaneously formed by the steps of:
    encoding said frames to form a play bitstream;
    subsampling said broadcast video frames;
    buffering said subsampled frames;
    recalling said buffered frames in a forward time sequence order;
    encoding said recalled buffered frames to form said fast forward bitstream;
    recalling said buffered frames in a reverse time sequence order; and
    encoding said recalled buffered frames to form a fast reverse bitstream;
    broadcasting the broadcast bitstream to subscriber equipment, while contemporaneously storing the plurality of storage bitstreams within a storage device; and
    upon a subscriber selecting to view information previously broadcast by the broadcast bitstream, transmitting to the subscriber the storage bitstream;
    wherein said fast forward bitstream contains an indicator that delimits the end of available data such that a transition from said fast forward bitstream to at least one of said broadcast bitstream and said play bitstream is appropriate." (emphasis added).

As discussed above, the combination of Asamizuya, Liu, and Russo merely discloses the encoding of video frame sequence to form a storage bitstream, which is then stored in a memory device, copying and/or transmitting the stored encoded video bitstream respectively to another storage device or to a transmitter, and switching between trick play and normal playback. However, nowhere in these three references is there any teaching or suggestion of "broadcasting the broadcast bitstream to subscriber equipment, while contemporaneously storing the plurality of storage bitstreams within a storage device." The applicants invention first encodes real-time information contemporaneously as VCR-like bitstreams (i.e., normal, fast forward,and reverse play) are generated, and then stores these VCR-like bitstreams (i.e., the plurality of bitstreams contemporaneously as the real-time information is broadcasted illustratively to set-top terminals. Therefore, the Asamizuya, Liu, and Russo references fail to teach or suggest the applicants' invention as a whole.

Furthermore, the Lee reference fails to bridge the substantial gap as between the Asamizuya, Liu, and Russo references and the applicants' invention. In particular, the Lee reference discloses fast forward and reverse functions in a VOD system (see, Lee,

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Abstract).  Nowhere in the Lee reference is there any teaching or suggestion of "broadcasting the broadcast bitstream to subscriber equipment, while contemporaneously storing the plurality of storage bitstreams within a storage device."

Even if the four references could be somehow operably combined, the references would merely disclose the encoding of video frame sequence to form a storage bitstream, which is then stored in a memory device, copying and/or transmitting the stored encoded video bitstream respectively to another storage device or to a transmitter, and switching between trick play (fast forward and rewind features) and normal playback.  However, nowhere in the four references is there any teaching or suggestion of "broadcasting the broadcast bitstream to subscriber equipment, while contemporaneously storing the plurality of storage bitstreams within a storage device." Therefore, the four references fail to teach or suggest the applicants' invention as a whole.

As such, the applicants submit that claims 16-18 are not obvious and fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder.  Therefore, the applicants respectfully request that the rejection of claims 4, 11, and 16-18 be withdrawn.

### C.     Claims 5-8 and 12-14

The Examiner has rejected claims 5-8 and 12-14 under 35 U.S.C. §103(a) as being unpatentable over Asamizuya, Liu and Russo in view of PCT WO 96/13121 to McLaren (hereinafter "McLaren").  The applicants respectfully traverse the rejection.

The applicants have cancelled claims 5 and 12.  Therefore the rejection of these two claims is now considered moot.

Claims 8 and 14 depend from independent claims 1 and 9 and recite additional features thereof.  As discussed above, the combination of Asamizuya, Liu, and Russo merely discloses the encoding of video frame sequence to form a storage bitstream, which is then stored in a memory device, copying and/or transmitting the stored encoded video bitstream respectively to another storage device or to a transmitter, and switching between trick play and normal playback.  However, nowhere in the three references is there any teaching or suggestion of "broadcasting the broadcast bitstream

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to subscriber equipment, while contemporaneously storing the plurality of storage bitstreams within a storage device." Therefore, the three references fail to teach or suggest the applicants' invention as a whole.

Furthermore, the McLaren reference fails to bridge the substantial gap as between the Asamizuya, Liu, and Russo references and the applicants' invention. In particular, the McLaren reference teaches a first encoder for encoding original HDTV video information, and a plurality of secondary encoders for respectively encoding subsampled video signals at various rates (see, McLaren, FIG. 4). However, nowhere in the McLaren is there any teaching or suggestion of "the storage device storing the storage bitstream contemporaneous to the transmission system transmitting the broadcast bitstream."

Even if the four references could be somehow operably combined, the references would merely disclose the encoding of video frame sequence to form a storage bitstream, which is then stored in a memory device, copying and/or transmitting the stored encoded video bitstream respectively to another storage device or to a transmitter and switching between trick play and normal playback. However, nowhere in the four references is there any teaching or suggestion that "broadcasting the broadcast bitstream to subscriber equipment, while contemporaneously storing the plurality of storage bitstreams within a storage device." Therefore, the four references fail to teach or suggest the applicants' invention as a whole.

As such, the applicants submit that claims 8 and 14 are not obvious and fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder. Therefore, the applicants respectfully request that the rejection of claims 5-8 and 12-14 be withdrawn.

### D.     Claims 19 and 23-27

The Examiner has rejected claims 19 and 23-27 under 35 U.S.C. §103(a) as being unpatentable over Asamizuya in view of U.S. Patent 6,084,636 to Sugahara et al. (hereinafter "Sugahara") and Russo. The applicants respectfully traverse the rejection.

The applicants have canceled claim 19. Therefore the rejection of claim 19 is now considered moot.

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The applicants' invention in claim 23 (and similarly independent claim 24) recites:

"A method of providing demand television comprising the steps of:
encoding, in real-time via a first encoder, a broadcast video frame sequence to form a broadcast bitstream, while contemporaneously encoding, via a second encoder, the broadcast video frame sequence to form a storage bitstream;
transmitting said broadcast bitstream to a plurality of subscriber equipment for decoding;
storing said broadcast bitstream as a storage bitstream while said broadcast bitstream is being transmitted;
upon said subscriber equipment requesting said storage bitstream to enable review of information contained in said broadcast bitstream, transmitting said storage bitstream to said subscriber having requested the storage bitstream; wherein said storage bitstream comprises at least a play bitstream and a fast forward bitstream, and upon said fast forward bitstream being exhausted of data, automatically switching from said storage bitstream to said broadcast bitstream."
(emphasis added).

The test under 35 U.S.C. §103 is not whether an improvement or a use set forth in a patent would have been obvious or non-obvious; rather the test is whether the claimed invention, considered as a whole, would have been obvious. Jones v. Hardy, 110 U.S.P.Q. 1021, 1024 (Fed. Cir. 1984) (emphasis added). None of the references, either singly or in combination, teach or suggest the applicants' invention as a whole.

As discussed above and the Examiner concedes, the Asamizuya reference fails to teach or suggest "storing said broadcast bitstream as a storage bitstream while said broadcast bitstream is being transmitted." Rather, the Asamizuya reference discloses that a near video-on-demand (NVOD) compilation unit edits and compresses film stock such as video film or video stock recorded on video tape, stores them for a long period, and transmits required video information to the near video-on-demand playout unit in accordance with the broadcast. The encoder compresses and encodes the video signals and audio signals for the film stock or the VTR stock input via the switching circuit based on the MPEG-2 standard. Accordingly, the signal after the encoder is a digital AV signal compressed and encoded by the MPEG-2 standard. The communication controller fetches a corresponding program stored in the archive storage 116 according to a request from the broadcast side and instruction from the NVOD

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playout unit, that is, the compilation system controller receiving an instruction for supply at the program supply side, and transmits the same via the communication path to the NVOD playout unit (see, Asamizuya, col. 8, lines 51-56, col. 9, lines 3-19, and col. 10, lines 41-48). Nowhere is there any teaching or suggestion in the Asamizuya reference of "storing said broadcast bitstream as a storage bitstream while said broadcast bitstream is being transmitted."

Further, neither the Russo or Sugahara references bridge the substantial gap as between the Asamizuya reference and the applicants' invention. As discussed above, Russo merely discloses "if a time-shifted version of the program is being output for any reason, a FAST FORWARD command may be entered, in which case playback is speeded up until deactivation of the command, at which time normal playback resumes, resulting in the output of the program exhibiting a reduced time shift, including a zero time shift in the event the operator "catches up" with the incoming program as it is being received (see, Russo, col. 3, lines 31-38). However, nowhere in the Russo reference is there any teaching or suggestion of "storing said broadcast bitstream as a storage bitstream while said broadcast bitstream is being transmitted."

Moreover, the Sugahara reference discloses a first encoder and a second encoder. The first encoder receives an input signal and encodes the signal (GOP), and then stores the encoded GOP. The second encoder receives the encoded GOP from the storage device, plus a delayed version of the input signal (see Sugahara, FIG. 1, col. 5, lines 30-58). The encoder configuration of Sugahara is completely different from the applicant's invention. Specifically, the Sugahara reference fails to teach or suggest "storing said broadcast bitstream as a storage bitstream while said broadcast bitstream is being transmitted."

Even if the three references could somehow be operably combined, the combination would merely disclose encoding a video frame sequence to form a storage bitstream, switching from a storage bitstream to a broadcast bistream, and a pair of encoders, where a second encoder encodes information from a first encoder. Therefore, the combined references fail to teach or suggest the applicants' invention as a whole, since the references fail to teach or suggest, either singularly or in

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combination, "storing said broadcast bitstream as a storage bitstream while said broadcast bitstream is being transmitted."

As such, the applicants submit that claim 23 is not obvious and fully satisfies the requirements of 35 U.S.C. §103 and is patentable thereunder.  Likewise, independent claim 24 recites similar limitations as recited in claim 23.  As such and for at least the same reasons discussed above, the applicants submit that this independent claim also fully satisfies the requirements of 35 U.S.C. §103 and is patentable thereunder.  Furthermore, claims 25-27 depend from independent claim 24 and recite additional features thereof.  As such, and for at least the same reasons as discussed above, the applicants also submit that these dependent claims are not obvious and also fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder.  Therefore, the applicants respectfully request that the rejections be withdrawn.
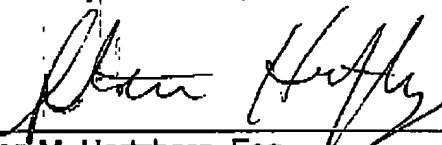
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## Conclusion

The applicants believe that all of the claims presently in the application are in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, it is requested that the Examiner telephone Steven M. Hertzberg, Esq. or Eamon J. Wall, Esq. at (908) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

Steven M. Hertzberg, Esq.
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Dated:____4/5/04____

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